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ABSTRACT

This report contains the goals, assumptions, objectives, and functions of the National Library and Information Service Network and its library bibliographic component. An overview is given of the networking activities in the U.S. today, and the operational and planned national bibliographic services of the Library of Congress, followed by sections on the role of the Library of Congress in the evolving network and the tasks that must be accomplished to give direction to the developing system. Appended is a proposal to the National Commission on Libraries and Information Science concerning the role of authority files in a National Bibliographic network. (Author/AP)

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TOWARD A NATIONAL LIBRARY AND INFORMATION SERVICE NETWORK

THE LIBRARY BIBLIOGRAPHIC COMPONENT

Prepared by the Library of Congress Network Advisory Group

Edited by Henriette D. Avram
and Lenore S. Maruyama

Library of Congress/Washington

June 1977

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PREFACE

The increasing pace of development in automated systems and library networks and the question of the proper relationship among these developing systems and the Library of Congress created the environment wherein the Librarian of Congress named a Special Assistant for Network Development in order for LC to participate more actively in national network planning. With this new position established, William J. Welsh, Deputy Librarian of Congress, invited senior representatives from ongoing systems to meet at the Library to explore the requirements and the possibilities for increased cooperation among the components of the evolving national system. This paper is the result of several of these meetings and represents the initial considerations for the library bibliographic component of the National Library and Information Service Network, described in greater detail below.

The first meeting, held on April 12, 1976, was conducted informally. Various networking issues were discussed, and the exchange of ideas appeared to be useful for all participants; therefore, it was decided that a second meeting would be convened for which the LC staff would prepare a working paper based on topics discussed at the April 12 meeting, to be used as a focus for discussion.

The second meeting was held on August 9, 1976, and began with a discussion of the LC role in the evolving national network and the mission and responsibilities of the participants in these meetings. Mr. Welsh asked that the attendees, as representatives of their organizations, act in an advisory capacity to the LC Network Development Office as the Network Advisory Group.

The working paper prepared for this meeting described network-related issues, such as assumptions, identification of components, alternative designs, etc., as well as four areas of concern: (1) objectives, (2) functions, (3) technical considerations (bibliographic and technical), and (4) policy considerations. After discussion of these four areas, a subcommittee of the Network Advisory Group was established to elaborate on the four topics. Lawrence G. Livingston from the Council on Library Resources was asked to chair the subcommittee. Other members requested to serve on the subcommittee were: James F. Govan, Southeastern Library Network (SOLINET), Eleanor Montague, Western Interstate Library Coordinating Organization (WILCO), and Roderick G. Swartz, Washington Library Network (WLN). The subcommittee was asked to prepare a paper for review and comments by the parent group.

Based on discussions at the April and August meetings, the subcommittee paper, and the comments of the advisory group on the latter, another working paper was prepared by the LC Network Development Office for discussion at the third meeting, held at LC on December 3-4, 1976. This meeting began with an announcement by the Deputy Librarian of Congress that LC was exploring ways for the Network Advisory Group to be constituted as a committee to advise the Librarian of Congress, Dr. Daniel J. Boorstin, on matters related to network development. It is important to note that the organizations will be the principals where membership is concerned, and the individuals will represent these organizations and will not be selected for their own expertise apart from their parent organization.

At this December meeting, the advisory group was divided into four working groups, each being assigned a section of the paper. The results of the individual working groups were reported to the full membership, and these reports were reviewed, modified, and augmented as required. In addition, other sections of the paper were reviewed and modified by the parent body.

The advisory group discussed at some length the intended scope of the working paper, i.e., what component of the National Library and Information Service Network was actually being addressed. The consensus was that at this time the advisory group and the LC Network Development Office were actually concerned with the library bibliographic component of the larger network, the National Library and Information Service Network. The term "library bibliographic" is used to indicate an emphasis on this component of the larger network as opposed to "library resource sharing" or the overall concerns of the total information community. While recognizing that resource sharing is equally as important as the library bibliographic component, this group felt that the library bibliographic component should be given the first priority at this time. It was acknowledged that a basic purpose of the library bibliographic component is to make known what library resources are available.

In the near future, work should begin on the library resource sharing component so that development of this component is not out of phase with the other components. To ensure a coherent network, work on library resource sharing should be integrated with the efforts of the Network Advisory Group or its successor and augmented by specialists as required.

In the following presentation, there are instances when the larger network, i.e., the National Library and Information Service Network, is being addressed and times when only the library bibliographic component is being discussed. It is sometimes difficult

to distinguish between the two. Naturally, when addressing the larger network, that discussion includes the smaller component, the library bibliographic component; however, when only the library bibliographic component is under consideration, this fact is noted. The terms "network" and "networking" also refer to both the smaller component and the larger network.

All meetings conducted to date were funded by the Council on Library Resources, which not only provided the means for the travel of the participants but gave so generously of staff time in support of the substantive work. Thanks are also due to Margaret Child, National Endowment for the Humanities, who was invited to serve as an observer and willingly participated as a member of one of the working groups, and to Ruth Tighe, National Commission on Libraries and Information Science, who provided invaluable assistance by recording the minutes of the later meetings. Without her ability to bring order out of chaos, this report might never have been completed.

This document now represents the efforts and opinions of the Network Advisory Group, and the membership responsible for its compilation is listed at the front of the paper. With the formation of the Network Advisory Committee, this group will be augmented by representatives from other organizations, and some of the current representatives may no longer be serving on the committee. The assistance and support provided by the Network Advisory Group are greatly appreciated, as well as their willingness to devote time from their own busy schedules for this effort.

Earlier versions or drafts of this paper carried the title The Library Bibliographic Component of the National Library and Information Service Network. After comments from other network organizations and experts in the field, the title has been changed and minor editorial revisions made to clarify some ambiguities. It is hoped that this document will provide not only a forum for discussion but also the basis upon which we can move ahead together to build an effective library bibliographic component of the National Library and Information Service Network with agreement on the tasks to be performed and on the priority assigned to each task.

Henriette D. Avram
Director, Network Development Office
Library of Congress
June 1977

DEFINITIONS OF TERMS USED IN THIS REPORT

Assumption--the supposition that something is true.

Bibliographic control--all functions to organize materials for effective retrieval by the ultimate user after the acquisition of material and before the actual use of the material in a library or other organization; also known as catalog control.

Bibliographic processing services--services which assist a library in establishing bibliographic control over its materials and in creating retrieval mechanisms for them; for example, cataloging services, card production services, etc.

Bibliographic utility--an organization which maintains large online bibliographic data bases enabling it to provide processes and products to libraries and library patrons and whose purpose includes reducing the rate of increase of per-unit costs in libraries and making resources widely available to library patrons; examples of existing utilities include Bibliographic Automation of Large Library Operations Using a Time-Sharing System (BALLOTS) and the computer operation portions of the Ohio College Library Center (OCLC), the Washington Library Network (WLN), and the Research Libraries Group (RLG).1/

Center of excellence--an institution designated with the responsibility to collect and catalog in a special subject area.

COMARC (COoperative MARC)--a project being operated by the Library of Congress and funded by the Council on Library Resources to obtain machine-readable records converted by other institutions using LC cataloging copy as their source for input.

Committee for the Coordination of National Bibliographic Control--jointly funded by the Council on Library Resources, the National Commission on Libraries and Information Science, and the National Science Foundation, its function is to monitor and facilitate the attainment of national bibliographic control; the committee works in several modes: through working parties (i.e., ones on a national name authority file and a format for journal articles and technical reports); through individual contractors; through meetings of representative experts in a particular area; and through official standards organizations after sufficient preliminary work has been done.

Component--a constituent part or ingredient; in this paper, may also refer to the potential members of the National Library and Information Service Network.

CONSER (CONversion of SERials)--a project to create a national serials data base through the efforts of 14 institutions; the project is being managed by the Council on Library Resources with the online input facility at the Ohio College Library Center.

Content designators--explicit identifiers in a machine-readable record; specifically in Library of Congress MARC records, refer to tags, indicators, and subfield codes.

Coordinate--to bring into a common action, movement, or condition.

Distributed computer processing--also referred to as Distributed processing system; what was implied in this paper should have been the term "distributive," i.e., capable of being dispersed, such as distributing application processing among mini-computer-based processing modules, each with several computers; "distributed" has the connotation of separate geographic locations--a distributive system can also be distributed but the reverse is not true.2/

Distributed data bases--data bases or portions of data bases, e.g., indexes, holdings, etc., that are in separate locations and logically interconnected.

Format recognition process--a technique whereby computer programs would assign content designators in machine-readable cataloging records by examining data strings for certain keywords, significant punctuation, and other clues.

Function--the action for which a person or thing is specially fitted or used, or for which a thing exists.

Goal--the end toward which effort is directed, usually involving prolonged effort.

International Standard Bibliographic Description (ISBD)--a standardized description of an item which assigns an order to the elements and specifies a system of symbols to be used in punctuating the elements; adopted by large segments of the international library community, including the United States, as the basis for descriptive cataloging rules.

Library bibliographic component--library bibliographic aspects as opposed to library resource sharing or the total information community.

Multistate--consisting of two or more states, as in multistate service center; see also "Regional."

National bibliographic control--the systematic handling of bibliographic data from the time a book or other library material is acquired in the United States until its cataloging by libraries in the country; other segments of the information community also use this term in a broader and somewhat different context.

National bibliographic service--service emanating from a national bibliographic agency, e.g., the Library of Congress, to support the nation's libraries by eliminating costly duplication of bibliographic processing, providing tools for consistent and uniform cataloging data, and providing a national interlibrary loan tool.

National Program for Acquisitions and Cataloging (NPAC)--a program operated by the Library of Congress whereby current monographic materials of research value from about 50 different countries are acquired and cataloged, and the resulting cataloging data are disseminated as rapidly as possible; from about half of these countries, cataloging data are obtained from the national bibliographic agencies and utilized as much as possible in the creation of LC catalog cards; also several major research libraries in the program contribute reports of titles being acquired that had not been cataloged by the Library of Congress--about 20 percent of these titles are subsequently acquired and cataloged (the remaining were already in the LC processing stream).

Objective--something toward which effort is directed.

Regional--in the context of this paper, refers to a multistate region, i.e., composed of two or more states; see also "Multistate."

Remote entry--form of information processing in which remote terminals, i.e., terminals located awry from the central computer system, access a computer via some type of communication line; also known as remote terminal processing system.

Resource libraries--libraries that contain extensive collections (general or in special areas) and which may be designated as national, multistate, or statewide resources; may be accessible under specific conditions to a broad segment of the population.

Service center--an organization acting as a broker or distributor of computer-based services from one or more bibliographic utilities in a particular region or operating other bibliographic services such as a union file of location information, a photocopy center, or offering computer-based information retrieval services.3/

Task--an assigned piece of work often to be finished within a specified time.

Universal bibliographic control--the systematic handling of bibliographic data from the time a book is printed anywhere in the world until its cataloging by libraries in many places is completed.4/

REFERENCES

1. Library Networking in the West: The Next Three Years. (Boulder, Colo., Western Interstate Library Coordinating Organization, 1976). 5th draft. p. 1. These definitions have been revised and augmented by Frederick G. Kilgour, a member of the Network Advisory Group.

2. Foster, John D. "Distributive Processing for Banking." Datamation, v. 22, no. 7, July 1976, p. 54.

3. Library Networking in the West, p. 1.

4. Kaltwasser, Franz Georg. "Universal Bibliographic Control (UBC)." Unesco Bulletin for Libraries, v. 25, no. 5, Sept.-Oct. 1971, p. 252-259.

1. SUMMARY AND RECOMMENDATIONS

This report contains the goals, assumptions, objectives, and functions of the National Library and Information Service Network and its library bibliographic component. An overview is given of the networking activities in the United States today and the operational and planned national bibliographic services of the Library of Congress, followed by sections on the role of the Library of Congress in the evolving network and the tasks that must be accomplished to give direction to the developing system.

At its meeting on December 3-4, 1976, the Network Advisory Group recommended that selected tasks in Section 5 of this paper receive the highest priority for action and that work begin immediately to carry them out. Along with a brief description of each task, a citation is given to the complete description in Section 5. Where work has already begun, its status is included.

1. Expansion of the LC national bibliographic service--In order to build the bibliographic apparatus for the LC national bibliographic service, all of the tasks given in Section 5.2 (Tasks for the Operational Units of the Library of Congress) have a very high priority. Nevertheless, the highest priority should be given to the conduct of a study to determine the LC hardware and software configuration and resources required to operate its national bibliographic service and to function as a node in the National Library and Information Service Network (Section 5.2, Task 1). Such a study is a prerequisite to the design and implementation of expanded capabilities within the national bibliographic service.

   Strategy: The study would best be conducted by LC staff under the auspices of the Network Development Office.

   Status: Preliminary work has begun.

2. Design of the network configuration or architecture (Section 5.1, Task 1)--This task includes the generation of functional specifications and system design for the hardware, software, and communication configuration best suited to meet local, multistate, and national networking requirements.

   Strategy: A small task force of technical staff should be formed from library networking organizations with operational automated systems to analyze the problems, identify potential projects, prepare proposals for near- and long-term phases, and perform certain well-defined tasks.

To provide this task force with a starting point based on the existing systems in libraries, library networks, etc., a subcommittee of the Network Advisory Group was appointed to construct the "first cut" of a high level systems diagram of the library bibliographic component.

Status: The task force has been established and its first two meetings were held on February 7-8, and March 31-April 1, 1977. Funding for subsequent meetings has been obtained from the Council on Library Resources. Objectives of this group have been summarized in Appendix 4 of this document.

3. Legal and organizational structure (Section 5.1, Task 3)--The capping agency for the overall National Library and Information Service Network has not yet been designated. Its designation may well require Federal legislation and could take one of the following forms: a) official Federal agency, b) not-for-profit organization, c) for-profit organization, or d) quasi-public/ private agency. This task will not concern itself with the definition of the overall capping agency. It will, however, be concerned with the definition of the library bibliographic component of the National Library and Information Services Network.

This task includes a determination of the legal and organizational structure, including location, governance, and membership; funding; operational responsibility including management and coordination; staffing needs; and relationships with LC, the National Commission on Libraries and Information Science, funding agencies, the Federal government, and multistate and state networks.

Strategy: A subcommittee of the Network Advisory Group should be formed consisting of a member from the LC Network Development Office, NCLIS, the Council on Library Resources, the Council for Computerized Library Networks, and the Ohio College Library Center that will, with contractual support as needed, perform this work.

The report of this subcommittee will serve as a discussion paper for the Network Advisory Group or its successor. Once it has been reviewed, revised, and accepted by the advisory group, this report will become an official recommendation for implementation from the Network Advisory Group to LC and NCLIS and will also be disseminated to all interested parties. Until the management of the library bibliographic component can be formed, the LC Network Development Office, with advice from the Network Advisory

Group, will continue in its role as the principal coordinator. It is recognized that such an agreement carries with it a dual responsibility for the Network Development Office (1) to coordinate the planning activities leading toward the development of the library bibliographic component of the network and (2) to accelerate the progress of LC's networking activities.

Status: The first meeting of the subcommittee is scheduled for July 1977.

Although not listed as a specific task, the members of the Network Advisory Group did agree to disseminate this paper to the membership and governing boards of their respective organizations and to work toward acceptance of this paper as a planning document for the library bibliographic component of the National Library and Information Service Network. The Network Advisory Group also endorses the efforts of the Library of Congress to obtain additional resources (staff, funding, etc.) to perform the tasks listed in Section 5.2.

2. BACKGROUND

Network activities in the library and information communities are summarized below as evidence of the wide spectrum of areas that are affected by automated techniques and, in particular, by communications technology. The existence of all of these endeavors also points to the need for overall coordination and cooperation among the various segments. This section describes briefly existing network activities in the United States and existing national services at the Library of Congress.

2.1 Existing Network Activities

Computerized library networks have emerged as the dominant trend in library automation during the 1970's. Such networks are not described here in any detail since other publications have dealt with this topic in greater depth.1/ These networks, both existing and proposed, constitute an important ingredient in the formation of a national network. In relation to the library bibliographic component of the National Library and Information Service Network, these computerized library networks can be grouped in the categories given below. It should be noted that none of these categories can be clearly defined. The functions performed by each level have evolved over the years and will continue to evolve. In addition, several of the organizations perform functions at more than one level, e.g., the Washington Library Network or the Ohio College Library Center operate as bibliographic utilities and state-wide service centers.

1. Bibliographic utilities--These consist of organizations which maintain large online bibliographic data bases enabling them to provide processes and products to libraries and library patrons, and whose purpose includes reducing library operating costs and making resources widely available to library patrons. Some of the existing utilities include Bibliographic Automation of Large Library Operations Using a Time-Sharing System (BALLOTS) and the computer operation portions of the Ohio College Library Center (OCLC), the Washington Library Network (WLN), and the Research Libraries Group (RLG).

2. Multistate service centers--These consist of organizations established to reduce library operating costs and to improve services and access through library cooperation. Members of these service centers find that these arrangements are cost-effective in the long term and that such interdependent action by a number of libraries improves library access.

These regional centers implement computer-based services from one or more of the bibliographic utilities and commercial vendors. They may also perform the following functions: (1) operate other reference and bibliographic services such as maintaining union files of location information, interlibrary loan services, and copy centers; (2) offer computer-based information retrieval services from commercially available data bases such as those from the New York Times, Lockheed, Systems Development Corporation, and others; and (3) provide education about the services and the utilization of the bibliographic utilities or commercial vendors. Some of the centers are also developing technical components, e.g., message concentrators and other data processing capabilities to provide for distribution of vendor services to individual members.

Some of the multistate service centers include the New England Library Information Network (NELINET), Southeastern Library Network (SOLINET), AMIGOS Bibliographic Council (AMIGOS), Midwest Region Library Network (MIDLNET), Bibliographical Center for Research (BCR), Pacific Northwest Bibliographic Center (PNBC), and Pennsylvania Area Library Network (PALINET).

3. State-wide, intrastate service centers--Similar services to those described under Multistate service centers, including information "hot lines," have also been developed at state and intrastate levels. In many cases, these services rely on computer-based bibliographic services provided by larger jurisdictions or directly from bibliographic utilities. Examples of networks which provide some of these services primarily at these two levels include the California Library Authority for Systems and Services (CLASS), Indiana Cooperative Services Authority (INCOLSA), Five Associated University Libraries (FAUL), Pittsburgh Regional Library Center (PRLC), Illinois Library and Information Network (ILLINET), New York Interlibrary Loan Network (NYSILL), Minnesota Interlibrary Teletype Exchange (MINITEX), and certain components of the Washington Library Network (WLN).

4. Resource libraries--Resource libraries are those which contain valuable or extensive collections in general or special subject areas that may be designated as national, multistate, or statewide resources to be made accessible under specific conditions to a broad segment of citizens. Many of these libraries are members of the Association of

Research Libraries. Some of these institutions, such as the University of Chicago, Northwestern University, or Stanford University, also have the potential capability to integrate technically with other segments of the library bibliographic component as bibliographic utilities.

Other related activities exist that do not fit into any of the above categories. These include:

1. Federal libraries network activities--Network activities within the Federal libraries are being coordinated by the Federal Library Committee, whose secretariat is funded by and located in the Library of Congress. Projects that could have an impact on the library bibliographic network include the establishment of a telecommunication system for Federal libraries using the lower rates offered by the U.S. General Services Administration and using existing network telecommunications, the feasibility of creating a data base of Federal government documents, and the utility of minicomputers for Federal library applications. The Federal Library and Information Network (FEDLINK) project, which operates in a similar mode as a multistate service center, should offer considerable useful experience for the evolving library bibliographic component in that its service area is not limited to any geographic area.

2. Council of Computerized Library Networks (CCLN)--This organization was established to provide an avenue by which members could identify common problems of development and operation of library networks, and coordinate solutions to these problems. Its membership presently consists of 24 library consortia, regional groups, or library networks.

3. Network activity at the national libraries--The extensive computerized network operated by the National Library of Medicine has concentrated on information retrieval functions. Subscribers have online access to several data bases: MEDLINE, consisting of citations to current literature in biomedical journals; CATLINE, consisting of references to monographs and serials cataloged since 1965 by NLM; AVLINE, consisting of references to audiovisual instructional materials in the health sciences; and a name authority file for personal and corporate names and series decisions used by NLM. NLM has also made available through its computer facilities the citation files in medical and health sciences from other government agencies.

The National Agricultural Library has undertaken the development of a national agricultural sciences information network to link libraries of land grant universities and other agricultural and forestry libraries in support of agricultural research, regulation, education, and extension work. Functions that are partially implemented or in planning stages include regional document delivery services, preservation and microfilming of state agricultural publications, cooperative regional acquisitions and cataloging of locally published agricultural documents.

4. Information retrieval services--Commercial firms such as the New York Times, Lockheed, Bibliographic Retrieval Services, or Systems Development Corporation provide online access to over 80 data bases to their subscribers for information retrieval functions. Since these data bases deal primarily with citations from periodicals and technical reports in scientific and technical fields, they, along with MEDLINE, form a vital component of this country's computerized bibliographic system.

5. Other parts of the private sector--In addition to the commercial firms concerned with information retrieval as noted above, there are also numerous organizations, such as vendors and publishers, in the for-profit and not-for-profit parts of the private sector which are engaged in the production, processing, and distribution of information. Their impact on the library bibliographic component of the National Library and Information Service Network is considerable in that many libraries rely on commercial firms to supply them with various tools required for acquisition and bibliographic control of their collections.

6. Communication carriers--Value-added networks such as TYMNET and TELENET and other common carriers such as the phone companies will have an impact on network implementation. Developments in areas such as satellite transmission need to be monitored.

In addition, the Western Interstate Library Coordinating Organization (WILCO), while no longer operating as an active program of the Western Interstate Commission for Higher Education, has made valuable contributions in the area of networking. Its working paper Library Networking in the West: The Next Three Years describes the goals and tasks for the western library agencies in the area of interstate resource sharing. These state agencies, in the form of the Western Council of State Libraries, moving toward implementation of the tasks identified through the networks in that area, e.g.,

the Bibliographical Center for Research, the Washington Library Network, and the Pacific Northwest Bibliographic Center.

2.2 Existing National Services at LC

The Library of Congress has been providing bibliographic services to the nation's libraries, and indeed to libraries around the world, since 1901 with the first distribucion of printed cards for titles cataloged by the Library. Its bibliographic products are presently distributed in several forms, including proofsheets, book catalogs, and machine-readable tapes as well as printed cards, for approximately 250,000 titles a year in over 50 major languages and over 250 minor ones.2/ It also maintains and publishes the National Union Catalog which is a central register of library resources in North America for which over 3.5 million reports are received every year. LC's work in authorities, particularly in the area of subject headings and classification (for both the LC classification scheme and the Dewey classification system) has provided invaluable assistance to the nation's libraries. Dissemination of name authority data in printed form was begun fairly recently in 1974. One of the most crucial factors in providing these services has been the availability of machine-readable cataloging records for books, films, maps, serials, and subject authorities because of their importance in the entire technical processing spectrum in both the Library of Congress and other libraries. It is expected that machine-readable name authority data will be available in 1977.

LC has also been heavily involved in standardization work. Its staff members have played a leading role in the compilation of the Anglo-American Cataloging Rules, the International Standard Bibliographic Description, machine-readable formats, character sets and bibliographic codes for machine-readable records, etc. In addition, much of the documentation prepared for LC internal use, such as data preparation manuals, have been made available to other institutions to assist and accelerate their automation efforts.

During the last two years, the Library of Congress has initiated several projects that are forming building blocks of the National Library and Information Service Network and are described in more detail in The Library of Congress as the National Bibliographic Center.3/

1. Online access to the LC MARC data base through a computer-to-computer connection--An 18-month pilot project was begun with the Research Libraries Group (consisting of the libraries of Columbia, Yale, and Harvard Universities and the New York Public Library) to provide online access to the LC MARC data base through a connection with the computer facility at NYPL. The pilot operational phase is expected to begin early in 1977. This project is the first step

in achieving sophisticated linkages between bibliographic utilities, multistate service centers, and the Library of Congress.

2. National holdings--In the absence of uniform coverage of holdings on a regional and local level, the Library of Congress has compiled holdings of monographic titles from 1956 to date in the National Union Catalog and its supplement, the Register of Additional Locations. To assist users of the RAL the Library has recently issued a cumulative microform edition and has provided online access to this file in the Library of Congress. Two studies, which are being funded by the Council on Library Resources, are nearing completion to identify other machine-readable data bases from which to obtain location data and to provide LC with information concerning the use of printed and microform editions.

3. Authorities--During the process of designing the MARC communications format for authorities and the distribution service for machine-readable authority data, the Library of Congress recognized the dichotomy between the use of authority files for bibliographic control in an individual institution and in a national data base. Phase 1 of a study which is being funded by the National Commission on Libraries and Information Science has been started to develop the methodology for a project to determine the role of authority files in the evolving library bibliographic network. A draft of the proposed project has been included as Appendix 1.

4. Role of the Library of Congress in the national network--Another study, which is being funded by NCLIS and is nearing completion, involves defining the role of the Library of Congress in the library bibliographic network. In addition, the major characteristics of existing or planned networks are being identified so that the major missing components can be determined. The preliminary results of the study are described in Appendix 2 of this paper.

5. Decentralized input--Three projects involving various aspects of decentralized input are in progress. CONSER (CONversion of SERials) is creating a national serials data base through the cooperative efforts of 14 institutions or organizations, including the Library of Congress. At present, this project is being managed by the Council on Library Resources with the online input facility at the Ohio College Library Center; the management and operations of this project are expected

to be moved to LC. A review of this project has appeared in an article in American Libraries.4/

COMARC (COoperative MARC) is another cooperative project being funded by CLR and differs from CONSER in that the machine-readable records are transmitted from the originating institution on tape. The data, which consist of complete monographic cataloging records in the MARC II communications format, have been derived from LC cataloging (from printed cards, proofsheets, or book catalogs) and converted by the participating libraries because the titles were not within the scope of the MARC distribution service. The COMARC records are validated against the LC Official Catalog, corrected when necessary, and redistributed without charge to the participants and by subscription to all others. Another aspect of decentralized input, the design of an NUC reporting format, was investigated in an earlier study, also funded by CLR. Such a format designating a less complete level of MARC content designation would allow a larger number of libraries to contribute their machine-readable records to the national data base. It is expected that the central receiving source, e.g., the Library of Congress, would develop a format recognition process to upgrade such records to the full level of MARC content designation.

6. International MARC network--With the impetus of work performed at the Library of Congress on its MARC-related projects, various national bibliographic agencies abroad have been working toward the goal of universal bibliographic control through the exchange of machine-readable tapes containing the cataloging data for their respective country's imprints. To facilitate this process, LC staff have been instrumental in the design of a UNIMARC format that standardizes content designators for international exchange. The Library of Congress has already concluded agreements with the national bibliographic agencies in Canada, France, and Australia, and is in the process of arranging agreements with other national agencies for tape exchanges. Canadian MARC tapes can now be obtained from the LC Cataloging Distribution Service. In these projects and in others, LC staff members have worked closely with the International Federation of Library Associations, the International Organization for Standardization, and with the national bibliographic agencies themselves. An LC staff member is also on the steering committee overseeing the study of a MARC international network.

To accelerate network activities related to bibliographic services, a new position for a Special Assistant for Network Development was established in the Office of the Librarian in February 1976. (The name of this position was changed to Director of the Network Development Office in March 1977.) This is a firm indication that the Library of Congress is committed to take a leadership role in the design and development of the library bibliographic component in coordination with other network-related organizations.

The activities described on the preceding pages provide ample evidence that networking can be viable. These activities also indicate that coordination and cooperation must be undertaken now if the proposed National Library and Information Service Network and its library bibliographic component are to become a reality.

REFERENCES

1. One recent publication describing networks is: Martin, Susan K. Library Networks, 1976-77. (White Plains, N.Y., Knowledge Industry Publications, 1976).

2. In 1976 there were approximately 160,000 machine-readable records for titles in over 150 different languages distributed.

3. The Library of Congress as the National Bibliographic Center; Report of a Program Sponsored by the Association of Research Libraries, October 16, 1975. (Washington, Association of Research Libraries, 1976). p. 39-40.

4. Avram, Henriette D. and Anable, Richard. "The Next Generation of CONSER." American Libraries, 7: 21-27 (January 1977).

3. GOALS, ASSUMPTIONS, OBJECTIVES, AND FUNCTIONS

Some of the initial planning for a National Library and Information Science Network has been started concurrently with the activities described in the previous section. The National Commission on Libraries and Information Science recommended the establishment of such a network in its study Resources and Bibliographic Support for a Nationwide Library Program.1/ This network would consist of three coordinated parts:

1. "A Resource System designed to provide guaranteed access to all needed materials through designation or development of libraries or other information facilities which will provide such access, and through coordination of collection development support to insure that needed materials are collected and made available for users."

2. "A Bibliographic System designed to provide a unique authoritative bibliographic description for each item held in guaranteed access, as well as the locations of such materials. In developing and providing this requisite bibliographic support, the Bibliographic System should also provide related technical processing services aimed at reduction of unnecessary duplication of library functions in order to permit greater cost effectiveness in processing library materials and improvements in staff utilization in local libraries."

3. "A Communications System designed to provide online communication of bibliographic data and requests for data and services between levels of the network. The System should facilitate communications among the multiple components of the National Library Network, including provision for educational and training programs for staffs and users."2/

The library bibliographic component of the National Library and Information Service Network proposed in this paper encompasses segments of the communication system and bibliographic system recommended in the NCLIS study. Since full integration of network components can only be developed as part of an evolutionary process, the first priority is being given to the development of the computerized library bibliographic and library communications systems. In the near future, work should begin on the library resource system so that it will not be out of phase with the other components.

As noted in the previous section, various aspects of the library bibliographic component have been started or even implemented, but a coherent design by which these accomplishments could be measured has been lacking. This section describes the goals, assumptions, objectives, and functions of the National Library and Information Service Network and its library bibliographic component. When addressing the larger network, the discussion also includes the smaller one. It should be noted that some of the goals, assumptions, and objectives have been taken from other sources and have been restated here in light of networking activities.

3.1 Goals

The goals of the National Library and Information Service Network, some of which were included in the program document of the National Commission on Libraries and Information Science, 3/ can be stated as follows:

1. Develop, strengthen, organize, and make available, to the maximum degree possible in the public interest, the total library and information resources in the United States. Such resources represent the cumulated and growing record of much of our nation's and, indeed, much of the world's total cultural experience in the intellectual, social, technological, and spiritual realms.4/

2. Provide to all the people of the United States, according to their individual needs, realistic and convenient access to these national resources for their personal enrichment and achievement and, thereby, for the progress of society.5/

3. Create a nationwide network with the help of new technology and with national resolve so that the disparate and discrete collections of recorded information in the United States would be integrated in due course.6/

4. Improve library and information services while reducing the rate of increase of per-unit costs in providing these services.

5. Promote the development of the expertise and knowledge necessary to implement and operate the National Library and Information Service Network.

3.2 Assumptions

The creation of the National Library and Information Service Network is based on the following assumptions:

1. A national system of linked bibliographic processing services is urgently needed to achieve the goal of access to the library and information resources in this country.

2. Such a system will develop from the existing bases of libraries, library networks, abstracting and indexing services, information delivery systems, and publishers. What will evolve is a confederation of discrete and disparate systems, which voluntarily exchange information among themselves according to standards that are cooperatively developed and adopted. Each organization is, and will remain, free to design its own internal formats, procedures, products, and services. Compatibility among these diverse systems will be achieved by standardizing the structure, content designators, and data content of the records to be exchanged among them as well as standardizing the method of communication between them.

3. The national component will be coordinating its activities with the existing or developing networks and service centers on multistate, state, and intrastate levels, and with other network-related organizations, both public and private.

4. A single entity, governed collectively, will be created as the instrumentality for network development. Governance, legal and organizational structure, funding, management, etc., of such an entity for the national component need to be determined as soon as possible so that the development of the national component can proceed in an efficient and orderly fashion in phase with networks on the multistate, state, or intrastate levels.

5. All the bibliographic tasks, products, and services necessary in the network cannot be performed by one agency. A division of labor is required with varying scales of decentralization of cataloging and input and centralization of authority and responsibility for bibliographic integrity.

6. The national component of the National Library and Information Service Network will be responsible for performing only those functions that can be performed most efficiently and effectively at the national level.

7. The bibliographic activities of the Library of Congress, including the creation, maintenance, and dissemination of cataloging data, union catalog information, classification schedules, or authority files, will play an important part

in the proposed network. LC will continue to develop MARC formats as needed and encourage their use.

8. Bibliographic control in the United States must be complementary to and compatible with international efforts of universal bibliographic control and must conform to national and international standards.

9. Some of the knowledge needed to implement and operate the National Library and Information Service Network does not yet exist and must be developed.

3.3 Objectives

The objectives of the National Library and Information Service Network can be stated as follows:

Objective 1: Foster cooperation, coordination, and communication among libraries and other organizations to promote efficiency, reduce redundancy, and promote resource sharing.

Objective 2: Support the development of and strengthen the quality and quantity of library and information resources in the United States.

Objective 3: Facilitate for the user the location, verification, and retrieval of informational materials from the most appropriate source.

Objective 4: Provide a system by which computer technology, telecommunications, and other technologies can assist users of library and information services.

Objective 5: Establish a research and development activity to produce the knowledge necessary for the continued development and operation of the network.

Objective 6: Support the Library of Congress in its role as a national bibliographic service center.

3.4 Functions

Based on the objectives given above, the following functions, while neither exhaustive nor finite, have been identified for the library bibliographic component of the National Library and Information Service Network at this time. Additional functions will undoubtedly be specified as work progresses on the national,

multistate, or state levels and as other components such as library resource sharing are integrated with the library bibliographic component.

Services

Function 1: Support the creation and maintenance of authoritative and consistent machine-readable data bases containing bibliographic records and make them available in a variety of forms, including online access.

Function 2: Support the creation and maintenance of various kinds of authority files to achieve the integrity and consistency required for access to the machine-readable data bases and make the authority files available in a variety of forms, including online access.

Function 3: Provide and/or coordinate access to relatively low-cost telecommunications to the requisite data base(s) for participants in the network.

Function 4: Provide a system whereby holdings information and subsequent interlibrary loan activity could be handled in a decentralized mode.

Function 5: Provide technical advice and assistance in the area of library bibliographic networking.

Coordination

Function 6: Coordinate information and/or access to bibliographic products and services that support and facilitate the major functions performed by libraries.

Function 7: Encourage the transfer and adaptation of software for certain applications among network components.

Function 8: Coordinate the library bibliographic component with corresponding components of other types of networks, e.g., networks concerned with information and document retrieval, international MARC networks, etc.

Standards

Function 9: Promote the development, promulgation, and application of standards and protocols relating to networks and networking with appropriate library agencies, standards organizations, etc.

Function 10: Monitor these standards and protocols and recommend changes or revisions when appropriate.

Communication

Function 11: Monitor and report on legislation or regulations originating in the Federal and State sectors that might have an impact on networking activities.

Function 12: Provide education, orientation, training, documentation, performance standards, etc., related to operational aspects of the network.

Function 13: Monitor, assess, and report on technological developments that might have an impact on libraries and networking to determine their applicability and desirability in the network.

Function 14: Monitor, evaluate, and report on the performance of the segments of the network.

Function 15: Act as a clearinghouse for library network and networking activities in the United States and provide technical advice and assistance in these areas.

Research and Development

Function 16: Initiate, coordinate, and participate in research and development activities related to networks and networking and seek the necessary funding to perform the work.

The technologies of computers and telecommunications have brought the library and information science fields to a new era. New approaches to information and its dissemination and use should be sought that would take advantage of these developments while recognizing the validity of many of the concepts of traditional librarianship. The remainder of this paper describes (1) the role of the Library of Congress in the proposed network, and (2) the tasks that must be accomplished by various groups to meet the goals, objectives, and functions of the library bibliographic component.

REFERENCES

1. Westat, Inc. Resources and Bibliographic Support for a Nationwide Library Program; Final Report to the National Commission on

Libraries and Information Science (Rockville, Md., 1974). 267 p.

2. Ibid., p. 2-3.

3. National Commission on Libraries and Information Science. Toward a National Program for Libraries and Information Services: Goals for Action (Washington, 1975). 106 p.

4. Ibid., p. x.

5. Ibid., p. x.

6. Ibid., p. x.

4. THE ROLE OF THE LIBRARY OF CONGRESS IN THE EVOLVING NATIONAL NETWORK

Concurrent with the activities of the Network Advisory Group, the Library of Congress has conducted a study to define the LC role in the evolving national network. The preliminary report for this study has been summarized in Appendix 2 for informational purposes and is accompanied by the assumptions that were the basis for the study and by the names of the advisors to the study. The Network Advisory Group has included certain recommendations from the study in this document as evidence of a consensus from the library community concerning LC's role in a network and to set the framework for the tasks to be accomplished. Although the preliminary report has been reviewed by that project's advisory committee, the final report has not been released yet; therefore, the Network Advisory Group cannot take a definitive position on its contents. Insofar as the preliminary report is reflective of the final report, this group endorses, in principle, the following recommendations:

1. LC should assume leadership in the development of the library bibliographic component by performing the major coordinating role in the application of technology and acquiring the funding needed to perform the tasks required.

2. LC should continue to create and distribute cataloging and authority data, increase cataloging coverage, and reduce cataloging delays.

3. LC should establish and maintain an online national bibliographic data base of cataloging and authority data. The data base would also contain the bibliographic records cataloged and converted to machine-readable form by organizations other than the Library of Congress. (It should be noted that the data base(s) could be physically located at separate sites. See Section 5.1, Task 4.)

4. LC should continue to make accessible a register of locations to be searched as a resource of last resort by participants in the National Library and Information Service Network.

5. LC should establish and coordinate improved training programs and an information communication operation with multistate service centers to inform the library community about the development and operational status of its activities and those of the library bibliograhic component of the National Library and Information Service Network.

5. TASKS

The tasks described below provide a blueprint for the development of the library bibliographic component of the National Library and Information Service Network in the near term, approximately the next three years. These initial tasks have been identified from the results of the network study (see Appendix 2), from the functions stated for the library bibliographic component (see Section 3.4), from suggestions by experts in the field, and from tasks identified by other network organizations. Additional tasks will undoubtedly be identified as work progresses and as the participants in the network prepare to integrate and coordinate their activities with those of the national network.

Because of the complex nature of these tasks, the work should be structured in phases, to the extent possible, to ensure availability of critical modules within a three-year time frame. The tasks for the library bibliographic component of the National Library and Information Service Network have been divided into (1) those that can be performed by a network coordinating agency or an interim agency, i.e., the LC Network Development Office, (2) those that can only be performed by the operational units of the Library of Congress, e.g., its Processing Department, MARC Development Office, etc., and (3) those that can be performed by other network organizations.

To the extent possible, the Network Development Office will also be performing the tasks necessary to accomplish some of the ongoing functions listed in Section 3.4, e.g., promoting the development, promulgation, and application of standards and protocols relating to networks and networking, acting as a clearinghouse for library network and networking activities in the United States, etc.

5.1 Tasks for the Network Coordinating Agency

Task 1: Design the technical network configuration or architecture--This task includes the generation of functional specifications and system design for the hardware, software, and communication configuration best suited to meet the local, regional (i.e., multistate), and national networking requirements. Specific areas of concern include message switching, identification of standard protocols, computer communication requirements, search query normalization, etc., as well as the work of the joint task force of the National Commission on Libraries and Information Science and the Institute for Computer Sciences and Technology of the National Bureau of Standards to

develop a protocol for computer-to-computer data interchange.

Strategy: A small task force of technical staff from library networking organizations with operational automated systems should be established to analyze the problems, identify potential projects, prepare proposals for near- and long-term phases, and perform certain well-defined tasks. (See also Appendix 3.) As work progresses, membership in the task force could be expanded to include representatives from other developing systems. The task force should report its findings and/or status of its activities to the Network Advisory Group or its successor at periodic intervals.

The first two meetings of the task force will be held in conjunction with the meetings that will be hosted by the Research Libraries Group and LC in connection with a pilot project funded jointly by the Carnegie Corporation and the National Endowment for the Humanities. Additional funds will be sought by the LC Network Development Office for future meetings since more than two will be required.

When any of the proposals developed by the task force are completed or are defined sufficiently to use for estimating purposes, LC will seek the funding to perform the work. The LC Network Development Office will serve as administrative and technical monitor, with the task force serving as an evaluation and steering team for contractual support to assist in the system design for the library bibliographic component of the network. To provide the task force with a starting point based on the existing systems in libraries, library networks, etc., a subcommittee of the Network Advisory Group was also appointed to construct the "first cut" of a high level systems design of the library bibliographic component.

Status: The task force has been established, and its first two meetings were held on February 7-8 and March 31-April 1, 1977. Funding for subsequent meetings has been obtained from the Council on Library Resources. Objectives of this group, which has been named the Network Technical Architecture Group, have been summarized in Appendix 4 of this document.

Task 2: Determine the role of authority files in the national network--The availability of authoritative and consistent machine-readable bibliographic catalog(s) through the aegis of the proposed library bibliographic network is dependent to a large degree on the availability of machine-readable authority files. The first phase of this task, to develop a methodology for a study on the role of authority files in the library bibliographic component of the National Library and Information Service Network, has been initiated with funding from the National Commission on Libraries and Information Science and is being directed by the LC Network Development Office. A draft of a proposal for the second phase has been attached as Appendix 1 of this document.

Strategy: The second phase of this project should be performed together with Task 4 described below (Configuration of the National Data Bases).

Status: Work on the methodology is nearing completion.

Task 3: Determine the legal and organizational structure of the library bibliographic component of the National Library and Information Service Network--This task encompasses the determination of the sources of funding, the legal basis, the organizational structure and management, the location, the membership, and the governance of the library bibliographic component of the National Library and Information Service Network. This task also involves defining the relationship of this component with the Library of Congress, the National Commission on Libraries and Information Science, funding agencies, the Federal, State, and local governments, and other networking activities. In addition, it is important to determine on a functional level the relationship of each network organization of each type (e.g., bibliographic utilities, multistate, state, or intrastate service centers) with each other and their relationship with resource libraries. The goal is not to achieve unanimity or uniformity since these are unlikely to occur because of historical, political, or geographic considerations, but to determine gaps in "coverage."

Strategy: A subcommittee of the Network Advisory Group consisting of representatives from the National Commission on Libraries and Information Science, the

Council on Library Resources, the Library of Congress, the Council for Computerized Library Networks, and the Ohio College Library Center should be established to provide the framework for a detailed investigation most likely to be conducted with contractual support. The subcommittee should submit its report for review, revision, and acceptance by the advisory group which, in turn, will submit it as an official recommendation to LC and NCLIS and disseminate it to all interested parties. Until the management of the library bibliographic component can be formed, the LC Network Development Office, with advice from the Network Advisory Group, will continue in its role as the principal coordinator. It is recognized that such an agreement carries with it a dual responsibility for the Network Development Office (1) to coordinate the planning activities leading toward the development of the library bibliographic component and (2) to accelerate the progress of LC's networking activities.

Status: The first meeting of the subcommittee has been scheduled for July 1977.

Task 4: Specify the configuration of the national data base(s)--Since an integral part of this task involves telecommunication links and message switching, it is necessary to have the design of the technical network configuration (Task 1) specified to a certain level of detail so that work on this task could proceed concurrently. Areas of concern that should be investigated are distributive data bases, including their subject coverage, frequency of use, and composition in terms of types of materials being controlled. The relationship with international online MARC networks must also be determined. In the area of holdings, several problems must be analyzed, including the conversion of retrospective holdings files (not only the feasibility but also the necessity), the development of multistate and state activities in this area, actual interlibrary loan capabilities from machine-readable holdings files, the relationship with local circulation files, unique identifiers for items not in LC, and standardization of holdings statements for serials and possibly for nonprint media issued in several formats.

Strategy: Work on this task should begin as soon as possible and be closely coordinated with efforts

proceeding on Task 1 (Design of Technical Network Configuration) and Task 2 (Role of Authority Files in a Network) described above.

5.2 Tasks for the Operational Units of the Library of Congress

Task 1: Conduct a study to determine the hardware and software configuration required at the Library of Congress to operate its national bibliographic service and to function as a node in the proposed network, and following its completion, design and implement the system--This task is of vital importance since the availability of online access to the LC data bases by outside libraries and institutions is dependent on having adequate computer support.

Strategy: The study should be conducted by LC staff under the general direction of the Network Development Office.

Task 2: Provide communication with outside libraries concerning existing or proposed bibliographic services, including such activities as training, giving speeches, attending professional meetings and conferences, participating in policy and technical meetings that are related to communicating with the library community.

Task 3: Make available all appropriate internal LC bibliographic, authority, and holdings data bases to external users and determine a pricing structure for the resulting products (hard copy, microform, magnetic tape, online searching, remote input, computer-to-computer transmission).

Task 4: Design and implement an online authority system for the Library of Congress and provide the interface with the authority system for the library bibliographic component of the network--The specifications for the latter will be defined in more detail after the completion of the authority study described in Appendix 1.

Task 5: Design and implement a remote entry input system--This system must handle both offline and online bibliographic and holdings records generated outside the Library of Congress, e.g., COMARC, CONSER, NUC (records not cataloged by LC) and from designated centers of

excellence. Some of these procedures are in place at this time, but the present system will require considerable review for possible modifications or augmentation. The creation and maintenance of the bibliographic files is dependent on the authority system (see Task 4 above). Another consideration with regard to holdings files will be the activity on the multistate or state levels in building such files (see Task 4 in Section 5.1).

Task 6: Design and implement a system to make available international MARC records as part of the national bibliographic service--This could include such procedures as mounting these files online for selection purposes by organizations outside the Library of Congress and for processing by the LC Processing Department.

Task 7: Design and implement a retrieval or query system to provide online access to bibliographic, authority, and holdings records--Portions of such a system exist but need to be augmented to provide access to a number of data elements in all types of bibliographic records and to provide more flexible searching techniques.

As a single organization, the Library of Congress has by far the largest amount of work to accomplish because of the magnitude and complexity of its bibliographic system. It, nevertheless, must find the means--equipment, funding, staff, and possibly legislation--to operate an efficient and effective dedicated system that will constitute a significant node in the proposed network. The Network Advisory Group wishes to add its endorsement of LC's efforts to obtain the necessary funding and staff to carry out these tasks.

5.3 Tasks for Other Network Organizations

There are numerous tasks to be undertaken by the networking community to supply undergirding detail to this preliminary network blueprint. One such task is described below:

Task 1: Define the role of state and multistate networks in the library bibliographic component--This should include goals, assumptions, objectives, functions, and tasks specific to these network organizations.

Status: The Council for Computerized Library Networks has appointed a subcommittee to prepare a draft statement of these roles.

APPENDIX 1

DRAFT

THE ROLE OF AUTHORITY FILES IN A NATIONAL BIBLIOGRAPHIC NETWORK: A PROPOSAL TO THE NATIONAL COMMISSION ON LIBRARIES AND INFORMATION SCIENCE

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July 15, 1976

Funds are requested for a project to define the role of authority files in the emerging national bibliographic network. This study will supplement an earlier investigation funded by the National Commission on Libraries and Information Science to define the role of the Library of Congress in this evolving network. Because any discussion of authority files and records involves the use of terms whose meanings can be ambiguous, the following definitions are given to explain these terms in the context of this proposal:

Authority File: a file with records that give the established or authoritative form of a heading selected for an institution's bibliographic records.

Authority Record: a record (in card form, in machine-readable form, a list, etc.) that gives the authoritative form of a heading selected for an institution's bibliographic records; variant and related forms of the heading can also be included, and depending on the institution's practices, other miscellaneous information could be recorded.

Bibliographic Record: a record that contains information related to a specific title or work.

Content Designation: the means by which data in a machine-readable catalog record are identified explicitly.

Cross Reference Record: a record that directs a user from a variant form of a heading to the authoritative form (a "see" reference) or from one authoritative form to another because they are related ("see also" reference).

Heading: the authoritative form of a name, subject, uniform title, series, etc., that is used as an access point to a bibliographic record or authority record.

Series: a number of separate works, usually related to one another in subject and issued in numeric sequence in a uniform style with a collective title.

Subject Subdivision: a term that is used to subdivide a subject heading into smaller components; generally used with voluminous subjects and includes three types: chronological, geographic, and general (e.g., "Bibliography").

Topical Subject: a subject heading consisting of a general term such as "Education," or scientific and technical terms, as opposed to a name.

Tracings: the means by which cross references are transcribed on an authority record; now appear as "x" preceding a "see from" reference or "xx" preceding a "see also from" reference (which, in a cross reference record become a "see" and "see also" reference, respectively).

Uniform Title: the particular title by which a work that has appeared under varying titles is to be identified for cataloging purposes (a conventional or filing title); also refers to those titles for anonymous works, radio and television programs, motion pictures, composite manuscripts or manuscript groups, or treaties and intergovernmental agreements.

Background

One of the essential components of bibliographic control is the creation and maintenance of authority files. An authority file alone or in conjunction with th bibliographic file is used to find an established form of heading or to determine that the heading is new to the system. In performing these tasks, the user should be led from variant forms of the heading to the established form by the "see" cross reference structure. In addition, the authority file should identify related headings through the "see also" cross reference structure. The authority record itself is used to maintain control over the cross references through the technique of tracings (see from or "x" and see also from or "xx").

The authority file could be used to control a variety of headings, including personal names, corporate names, uniform titles, series, topical subjects, geographic names, etc. Depending on the institution's function and needs, the kinds of headings under authority control may vary. For example, an extensive research collection may require control for all of these headings while a smaller and simpler collection may need to control only some of these headings and not in as much depth. Abstracting and indexing services may concentrate on controlling only topical subjects and corporate names, and so forth.

The advent of machine-readable authority and bibliographic files adds a few more capabilities to those mentioned above. Headings appearing in a machine-readable bibliographic record could be validated against the machine-readable authority record for correctness of form, of content

designation, etc., by computer programs. Changes to headings in the machine-readable authority files could be effected in the appropriate records in the machine-readable bibliographic files by automated techniques as well. In automated book catalog production, cross references from the variant or related headings can be generated from the authority files. The links maintained between the authority file and the bibliographic file would aid in the cataloging process.

To date, the role of a central agency such as the Library of Congress in the area of authority control has been primarily as the vehicle for the dissemination of authority data. The printed lists, Library of Congress Subject Headings and Name Headings with References, have been made available on a subscription basis. The Library is also about to embark on the distribution of subject authorities in machine-readable form and in microform during the summer of 1976. A project to input name authorities in machine-readable form is expected to begin later in 1976.

Historically, the development of machine-readable authority files has taken place primarily in institutions concerned with producing book catalogs, e.g., library systems such as those of the Washington Library Network and the New York Public Library, or commercial firms. Since the data base at the Ohio College Library Center does not have any central authority control, the individual libraries must maintain their own manual authority files, if they subscribe to the notion of full bibliographic control.

The development of authority files, whether in card form or in machine-readable form, has been based on an individual institution's particular function or requirements. For example, very few libraries other than the Library of Congress would need 41 references from the variant forms of headings for the United Nations. A national bibliographic agency might use the form of a personal name, such as "Chadwick, Charles," in one issue of its bibliography, and in another issue, "Chadwick, C." although both forms were for the same person. On the other hand, a library maintaining strict authority control over its records would recognize that the two forms were for the same person and choose one form.

Up to this time, authority control has generally been limited to the bibliographic records of an individual institution (although information to create the authority files may be obtained from outside sources). However, there are many advocates of the idea that centralized authority files would solve many of the problems of bibliographic control on both the national and international level. Cursory examination indicates that there are certain conditions that could have a significant impact on the design of an authority system for a national bibliographic network, and these should be carefully investigated.

1. The Library of Congress estimates that for every two new titles cataloged, there will be one new name authority created. The statistics of the existing LC name file show that approximately 70 percent of the names are personal names and of these, a large

percentage have no cross references. These figures appear to demonstrate that a large number of authors write only one book. If these figures are valid for other large collections, it could be that for personal authors, the use of the files might be minimal for cataloging purposes.

2. Records received from another national bibliographic agency will be in the language of the country. It has been recommended that equivalents be carried in the authority file as variant names. However, even assuming that the agency followed the same cataloging rules, it would still be difficult to determine that one entity was equivalent to another.
3. The utility of the authority files is minimal for online cataloging purposes without links from the authority record to the bibliographic records in which the heading is used. Thus, the design must take into account complex intrafile and interfile structures.

The proposed project is intended to determine the functions of authority files in the evolving national bibliographic network, to establish requirements, and to produce an overall design of an effective authority system. The project assumes that the Library of Congress is the interface with the MARC international community and that the Library of Congress system will at least maintain an online authority system linked to the LC MARC records for itself.

It is recognized that most components of the information community, e.g., libraries, publishers, abstracting and indexing services, etc., require some use of authority information. The design of an authority system to satisfy all the various requirements must, by necessity, be very complicated. It appears that to avoid diluting an effort, fraught with complexities, priorities must be assigned to the needs of the various components of the information community. Further, it is recommended that the first priority be given to those institutions where the majority presently utilize established authority systems for work concerned with bibliographical control, namely libraries, in the hope that emphasis on this segment will shed light on the resolution of the problems of the other segments. As the study proceeds, if there is a need, recommendations will be made for further studies to solve the broader problems.

Scope of Project

The following tasks have been identified, with the rationale for each given on subsequent pages:

Task 1: Identifying the requirements of the library community in the area of authority data.

Task 2: Defining the relationship between the requirements of the library community and those of the evolving national bibliographic network.

Task 3: Defining the relationship between different authority systems and the national bibliographic network.

Task 4: Defining the relationship between the Library of Congress' authority file requirements and those of the national bibliographic network.

Task 5: Correlating the requirements for decentralized input of bibliographic records with the requirements for centralized authority files in the national network.

Task 6: Producing the general design of the authority system for the national network.

Task 1

The requirements of the American library community in the area of authority control must be identified, not only for those libraries that have automated systems or access to one but also for those that have only manual systems. The needs of all types of libraries should be covered.

Specific problems related to name authorities that have to be addressed during the performance of this task include the following:

1. What categories of name authorities would be most useful to have available from the national network? (All names, corporate names, personal names, personal names with references, etc.?)
2. If an individual library maintains a name authority file, what type of names are under authority control? (All names, corporate names only, etc.?)

3. If an individual library maintains a name authority file, what elements are kept in the authority record to provide positive identification of a particular name? What elements are needed in authority records obtained from an outside source (e.g., the Library of Congress, another library) to provide positive identification of a name?

4. If libraries had access to name authority records from outside sources (e.g., other libraries, a regional network, a national network, or an international network), how would they operate without access to the bibliographic records in which the name heading was used?

5. Do libraries need access to the name authority records created by foreign bibliographic centers? If so, how do they anticipate using such records when certain parts of the name heading (e.g., geographic names such as Germany or Japan) or information such as history notes are in a language other than English?

For subject authorities, the following questions need to be addressed:

1. Should the network be concerned as to whether an individual library maintains a subject authority file and whether these authority records are maintained as a separate file from names or as a combined file?

2. If an individual library maintains a subject authority file following the Library of Congress subject heading system, does it control its authorities at only the primary heading level? At each subject subdivision level? Or a combination of both? For example, the subject entry in the bibliographic record is "United States--History--Civil War, 1861-1865--Songs and Music." Would there be an authority for each level?
3. If a library maintains a subject authority file, what types of headings are included, e.g., topical subjects, geographic names, etc.?

In addition, these areas need to be addressed:

1. What other types of authorities are controlled by an individual library? (Uniform title headings, author/uniform titles, series, etc.?)
2. What uses are made of authority records in a particular library or library system?

Task 2

The relationship between the requirements of the library community and those of the evolving national bibliographic network must be defined. Specifically:

1. Can the authority file requirements of individual institutions, which in the past have been based on differing functions, be fitted into a national scheme?

2. Can authority files that are consistent for an individual institution be merged in a national data base for authorities?
3. Are there examples of pooling of authorities from different institutions in a single data base?
4. What are the requirements for an authority system in a national bibliographic network?
5. How do institutions operating within a regional network interface with the national network in the area of authority control?

Task 3

The relationship between different authority systems and the national bibliographic network must be defined. Specifically:

1. What are the different rules or authority systems being used in the American library community?
2. How are the records or data in which the headings appear obtained?
3. Should the national bibliographic network provide access to the different authority files if the records in which the headings appear are not also available through the network?

Task 4

The relationship between the authority file requirements of the Library of Congress and those of the national bibliographic network must be defined. Specifically:

1. What are the requirements of the Library of Congress (as an individual institution) in the area of authority control?
2. Is there any statistical correlation of the characteristics of the LC authority files and those of the national network?
3. In what areas are the requirements of the Library of Congress compatible with those of the national network and in what areas are there conflicts?
4. How will the problem of using MARC international records following different rules and in different languages be resolved at the Library of Congress?

Task 5

The requirements for decentralized input of bibliographic records must be correlated with the requirements for centralized authorities in the national network. Specifically:

1. Does the national network have to maintain the integrity and consistency of an individual institution's authority files or does it maintain the integrity and consistency of the "national" authority files according to the records in the national bibliographic data base?

2. Should there be a central "authoritative" agency for authorities in the national network? If so, should this be the same as the "authoritative" agency for the bibliographic records available through the network?

Task 6

The general design of the authority system for the national network should be produced, based on the following criteria:

1. The resulting system should accommodate the requirements established in the previous tasks as well as the requirements for bibliographic records in the national network environment.
2. The design should result in a system that could be implemented within the state-of-the-art technology.
3. The design should result in a system that will not only meet the above-mentioned requirements but also operate in the most efficient way possible.
4. The general design of the authority system should also include provision for the monitoring of the operational system, i.e., the gathering of statistics to show the efficiency and effectiveness of the system.

Justification of Project

If a truly integrated national bibliographic service is desired, the design of two of its principal components, the bibliographic or cataloging record system and the authority system, must be accomplished as a single task. Requirements for the bibliographic record system are being identified through other projects so that it is imperative that the requirements for the authority system be identified as soon as possible.

Administration of Project

It is intended that the funds requested will be used to obtain contractual support to perform the tasks outlined on the previous pages. The project will be under the general direction of the Special Assistant for Network Development at the Library of Congress with assistance from staff of that office and staff of the Processing Department of the Library of Congress. An advisory committee composed of representatives from various interested groups will also be appointed.

Appendix 2

STUDY TO DEFINE THE ROLE OF THE LIBRARY OF CONGRESS IN THE EVOLVING NATIONAL NETWORK

A. Assumptions

The following assumptions were taken from the work statement prepared by LC for the conduct of a study to define the role of the Library of Congress in the evolving national network. Slightly modified for this presentation, these assumptions have been included here as background material.

1. The National Library and Information Service Network will develop from the base of existing libraries, system networks, abstracting and indexing services, information delivery systems, and publishers. What will evolve is a confederation of discrete and disparate systems, with standardization focused on the means of exchange among them. This is in general accordance with the national program document of the National Commission on Libraries and Information Science.1/

2. Identical internal systems for handling information in the United States are not likely. Each agency is, and will remain, free to design its own internal formats, procedures, products, and services. Compatibility among these diverse systems will be achieved by standardizing the structure, content designators, and data content of the records to be exchanged among them.

3. The bibliographic apparatus of LC constitutes a critically essential building block for any national program for libraries and information science.

4. The importance of the LC bibliographic apparatus does not change with the eventual choice of locus for the agency to manage the national network. Therefore, the LC role in the evolving network can be defined without waiting for final determination as to which agency will manage the network.

5. Given the long history of the Library of Congress as the main producer of bibliographic tools in this country, it is logical that it should become the national bibliographic node of the network and be responsible for the building and maintenance of a national bibliographic apparatus.

6. *LC cannot perform all the bibliographic tasks or provide* all the bibliographic products and services required by the network. There must be a rational division of labor with varying scales of decentralized cataloging and input and centralized authority and responsibility for the bibliographic integrity of the national bibliographic data base.

7. National bibliographic control in the United States must be complementary to and compatible with international efforts of Universal Bibliographic Control.

8. Not every institution in the United States will require online access to the national bibliographic data base. A hierarchy of access nodes is required.

B. Methodology

The Library of Congress received a grant from the National Commission on Libraries and Information Science to perform this study. Lawrence F. Buckland, Inforonics, Inc., was the principal investigator under the direction of the LC Network Development Office.

The contractor reviewed the ongoing activities and projected plans of the Library of Congress in the area of automation, some of which have been reported in Section 2.2 of this paper. Since the objective of the study was to pinpoint those areas where LC could support the activities of the multistate and state library networks and larger libraries of the National Library and Information Service Network, the plans of the major library networks were surveyed and compared with those of the Library of Congress. Where services were not planned at LC, these were noted.

The survey was carried out by interviewing network management and operating personnel as well as by speaking to a cross section of the library community, including large and small public and academic libraries, to insure that their requirements were heard. Interviewing the staff from these libraries precluded the possibility that some important library needs might be filtered out due to input being gathered only through network service organizations.

The emphasis of the project was on technical developments. The survey was limited to investigating possible roles of LC in only those library activities related to distribution of cataloging data, union catalog maintenance, reference support, personnel training, authority control data distribution, and standards development.

C. Results of the Study

The following summary statements were taken from a preliminary version of the Buckland study and reflect the information available at that time. The final report had not been released at the time this paper was prepared.

The results of analyzing network plans with the operational projects at the Library of Congress and its future plans for new services yielded very little. Most organizations could not add any additional requirements to the program. There was, however, great interest in having remote access online to LC's files with computer-to-computer transmission of requested records. This capability was given the highest priority to be initiated as soon as possible.

Distribution of cataloging data is, and probably will be for some time, the most important service the Library of Congress provides to the libraries in the United States. The survey inquired into the use of LC cataloging distribution services, cards, printed catalogs, cataloging aids, MARC tapes, and future services. The respondents wanted the time lapse between the appearance of a book and the appearance of its bibliographic record to be reduced. All forms of LC cataloging data distribution were encompassed by these comments: MARC records, catalog cards, book catalogs, etc.

With respect to promptness of cataloging of highly-used titles, the libraries which order books on approval plans feel the problem most severely. The public libraries surveyed feel the pressure to circulate books quickly, so that even a short delay of MARC services causes costly original cataloging, plus additional costs of reprocessing to use MARC records when they become available. It is especially irksome when the cataloging data for trade books are not available because the cataloger knows that subsequent availability of a MARC record is a certainty. The timeliness aspect of bibliographic record delivery is so crucial to public libraries that they emphasized that increased timeliness be given the highest priority. Comments about promptness of cataloging were so prevalent that the investigators rank it next to the online data base availability in importance.

After the requirement for increased promptness of cataloging data, increasing MARC coverage was ranked next in importance by those surveyed. The COMARC program was endorsed as satisfying some of these needs. Requests were made to have COMARC records available online as well as in tape form.

One of the ideas advanced by the investigators at the outset of the project was to provide network users with access to the LC in-process file to determine whether an item is in the cataloging process and to post a user-specified cataloging priority to that

item. The anticipated result is that a larger number of pertinent items will be cataloged more rapidly, and books lost in the processing cycle will be identified more quickly. This concept, however, is affected by LC selection policies. Unless LC has selected a book and entered a bibliographic record into its automated in-process file, there is nothing to which the priority can be posted. Such titles would then have to be acquired, causing considerable delay at a point where rapid action is desirable.

An elaboration of this idea would be to provide access to records acquired through the MARC international network. This would allow users to comment prior to the selection decision at LC, and if a title were not in the system, a request could be submitted for its selection.

These ideas were endorsed by all libraries surveyed that were large enough to have sizable original cataloging workloads. The favorable comments received from the libraries that are part of the National Program for Acquisitions and Cataloging appear to make it worthwhile to have these libraries online to the LC data base as a pilot project. The objectives of the project would be to test the concept of network libraries assigning cataloging priorities using NPAC reporting procedures.

Nearly all organizations and libraries interviewed expressed the desire to have LC lead in those technical areas surveyed by performing the "major coordinating role" in the development of the library bibliographic component of the network. The investigators feel that these comments form a consensus that LC should take the lead in coordinating the tasks to be accomplished in this area. This coordination should insure that projects are carried out carefully, with proper attention to standards of system compatibility and coordination of separate regional (i.e., multistate) efforts so that each service function would be performed at the proper place in the network.

These statements were in no way a rejection of the interviewees' responsibility for local or multistate development, but rather an appeal for the establishment of an overall coordinating authority. The respondents stated their willingness to work in a cooperative manner to supply requirements and guidance and also to purchase services both from LC and from multistate networks.

The coordinating activities to be encompassed within LC's role were stated as follows:

1. LC should conduct meetings where the responsible individuals from the development staffs of the various network

organizations would carry out the technical design work required. Those interviewed stated that there is a pressing need to specify the network architecture and urged that this be given high priority. Regional systems need specifications so they can begin to fit their respective efforts into the national system. LC and the regional systems should work independently to develop proposals for their respective functions, for services provided to others and services needed from others, and for data communication interfaces. When enough individual ground work has been done, a larger group should meet to seek agreement.

2. LC should conduct meetings to discuss the implications of the network on the actual organizations involved. Services in the network will be performed at certain levels to make efficient use of the machine and communication resources, but any library must be able to receive service from any organization. These links can be accomplished by equipment, but an organizational structure superimposed on the machine structure is needed to administer such an operation and its financing.

3. LC's role should include the coordination of funding for those developments which are critical to the national network. It is assumed that there will be development activity, all of which will require funding, in the regional networks, in other government library systems, and in specific resource libraries. To the extent that funding will be needed outside the organizations involved, such funding should be coordinated by LC.

4. All of the above assumes many working committees. LC should establish and schedule these activities and secure funds to cover the cost of travel, etc., of the working members. The survey uncovered a major concern about organizations being uninformed of LC's plans which, in cases where technical development is involved, could be detrimental.

Comments revealed a definite interest by regional centers and large single libraries to operate library service systems with in-house computers given access to a national data base. Such plans require a detailed knowledge of network interfaces in advance, so these centers and libraries wanted to be cognizant of network planning and development. They proposed that the following tasks should be started as soon as possible.

1. Conduct meetings with responsible individuals to develop specifications for the telecommunication and computer

architecture of the distributed computer processing required by the library bibliographic component of the network. To elaborate on the service roles of LC in the network, a distributed processing system was hypothesized by the investigator to impose some structure on the discussion. The individuals interviewed were questioned about a distributed system, and all of them agreed that such a system would in all probability be used for the network.

2. Conduct meetings with responsible individuals to specify the organizational structure of the national network to determine the level and the access routes by which network libraries' service requests are satisfied.

3. Establish those libraries that are part of the National Program for Acquisitions and Cataloging and are willing to participate, as the pilot group to be allowed online access to LC's files. This project would allow them to search LC's online catalogs and in-process files and report items requiring cataloging via online requests.

4. Initiate the development of a message communication system (e.g., an LC Processing Department cataloging hotline), superimposed over the computer data transmission network to transmit messages to and from LC using the same terminals and remote computers used for searching and record transmission.

5. Document a specific plan to install the various national bibliographic services. The plan should include a description of the service, the level in the national network which will be allowed access to the service (e.g., one level could be a service center, another level could be a member library of the service center), the date when a particular service will be implemented, and the cost of each service.

REFERENCE

1. National Commission on Libraries and Information Science. Toward a National Program for Libraries and Information Services: Goals for Action (Washington, 1975). 106 p.

D. Advisory Committee for the Study

Name	Title/Organization
Warren J. Haas	Vice President of Information Services and University Librarian, Columbia University
Frederick G. Kilgour	Executive Director, Ohio College Library Center
Samuel Lazerow	Senior Vice President, Institute for Scientific Information
Lawrence Livingston	Program Officer, Council on Library Resources
Maryan E. Reynolds	Former State Librarian, Washington State Library
James P. Riley	Executive Director, Federal Library Committee
William J. Welsh	Deputy Librarian of Congress, Library of Congress

Commissioners of the National Commission on Libraries and Information Science

Andrew A. Aines

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National Commission on Libraries and Information Science

Alphonse F. Trezza, Executive Director

Ruth L. Tighe, Research Associate

Project Director

Henriette D. Avram, Director, Network Development Office, Library of Congress

APPENDIX 3

CONCEPTUAL NATIONAL LIBRARY NETWORK CONFIGURATION

This appendix is a discussion of a conceptual design for the configuration of the National Library Network and will serve as input to the work to be performed by a task force (see Task 1 of the Summary and Recommendations). Considering the number of components identified as possible participants in the evolving National Library Network, there are many design configurations that could be hypothesized for the national system. A conceptual design of the future system with some major components in place could be used as the basis for future discussions. Levels of the components (if required) could be identified and the component functions and responsibilities described. However, for the present, without the roles of each component explicitly defined, the conceptual design permits us to move ahead on some of the technical tasks required since the design includes the linking together of the bibliographic utilities, a module of the network architecture that seems to have received fairly widespread agreement.

Bibliographic utilities would be linked to each other and geographically distributed around the nation. Each bibliographic utility would have associated with it regional service centers, state-based library systems (or individual libraries), and large resource libraries. The Library of Congress might be a bibliographic utility as well as providing the national bibliographic service.

This conceptual design is schematically represented in Figure 1. Any single bibliographic utility could have one or more regional service centers and one or more resource libraries associated with it. Among many other issues to be resolved in the near term are at least the following:

1. Will the service centers be linked to more than a single bibliographic utility?

2. Will service centers be linked to other service centers or to the Library of Congress?

3. How will the bibliographic utilities be linked, i.e., will each utility be linked to all other utilities, will each utility be linked to a predetermined utility, will each utility be linked to the Library of Congress?

4. How many bibliographic utilities are required?

5. Where does the private sector fit in?

6. Will service centers with mini-computers in operation as communications processors perform other networking functions such as to provide access to data bases not housed in the bibliographic utilities, to allow the offline (i.e., off the host computer of the bibliographic utility) input and editing of records, to provide the capability for tailor-made products, etc?

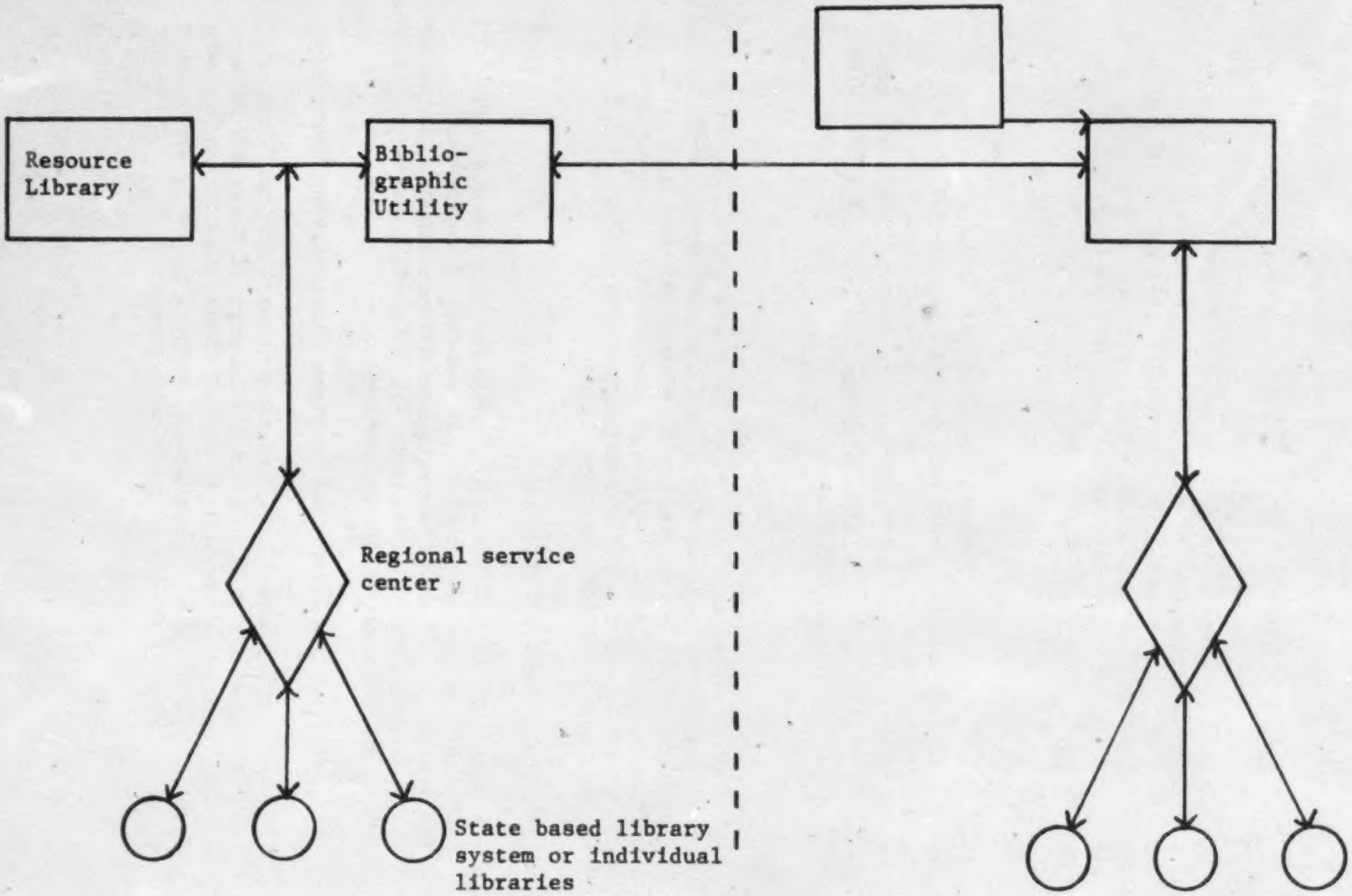
Resource Library
Biblio-graphic Utility
Regional service center
State based library system or individual libraries

FIGURE 1

Appendix 4

NETWORK TECHNICAL ARCHITECTURE GROUP OBJECTIVES AND PROJECTS

Introduction

At its second meeting on March 31-April 1, 1977, the Network Technical Architecture Group, after some deliberation based on the results of its first meeting, set forth its objective and related projects based on this objective. The following is basically a verbatim report of the objective and projects as prepared by the group, with amplification of certain points as required.

Objective

The objective of the Network Technical Architecture Group is to design and implement a technical network configuration or architecture in a cost-effective manner as stated in Task 1 of the tasks assigned to the Network coordinating agency in the document Toward a National Library and Information Service Network: The Library Bibliographic Component.

Project

In order to attain the objective described above, the Network Technical Architecture Group identified two primary projects (linking bibliographic utilities and designing a data base configuration), and within these projects a series of subprojects or steps directed toward accomplishing the primary projects. These primary projects and their subprojects are described below.

1.0 Link Bibliographic Utilities

The goal of this series of projects is to design and implement the network architecture needed to interconnect bibliographic utilities (expected to include BALLOTS, University of Chicago, Library of Congress, NELINET, OCLC, Research Libraries Group, and Washington Library Network).

1.1 Link Utilities to Library of Congress Using Current Protocols

Purpose: This project will create a network to link each of the bibliographic utilities to the Library of Congress system so that users at terminals of any of these utilities will have access to available bibliographic, authority, or location data bases maintained in the Library of Congress.

Strategy: This project will utilize communications protocols, message formats, and searching facilities available at the Library of Congress. Records will be transferred from LC to the utilities using the MARC communications format.

1.2 Link Utilities to LC Using Network Standard Protocols

Purpose: This project will upgrade the network described in 1.1 to the use of standard protocols.

Strategy: The communications network protocol used will be a national/international standard. The application level protocol will be that defined by the NCLIS/NBS Task Force on Computer Network Protocol.1/ Message formats for standard query text, standard bibliographic text, standard reply text, standard error text, and the registry of all such standard messages as well as host locations will be developed under this project.

During the course of its deliberations, the group recognized that the NCLIS/NBS task force was concerned with control information protocol, i.e., protocol describing types of transactions, message source, destination, etc., and that there was a need in the eventual network for standard message formats for query text, bibliographic text, reply text, error text, etc. The group agreed that this work could best be started by a contractor and that a formal proposal should be submitted to the Committee for the Coordination of National Bibliographic Control to engage a consultant to study existing message texts and make recommendations for standards to be used for communicating between bibliographic utilities. The Network Technical Architecture Group offered to act as the monitoring agency for this work and to determine the study objectives, task definitions, and the organization of the final report. At a subsequent meeting of the Committee for the Coordination of National Bibliographic Control, the members of that committee approved the Network Technical Architecture Group's recommendation, and funding for this work will be forthcoming. In addition to the message standards, the Network Technical Architecture Group also recognized the need in the future for a registry of standard message types as well as a list of host locations which the group also agreed to develop.

1.3 Link Utility to Utility

Purpose: This project will extend the network to provide bi-directional capability to link the bibliographic utilities, i.e., one utility may access records at the Library of Congress or other utilities and vice versa.

Strategy: Using the standard network protocols defined by the NCLIS/NBS Task Force on Computer Network Protocols, the network will be expanded to allow any system in the network to access any other system in the network. This capability will permit users of any system to search the data bases created by other systems. The network interconnecting all the systems will be independent of the hosts, so that if one system is not available, the network will still function properly. The network will be designed to allow the inclusion of additional hosts with minimal impact and will facilitate the development of the national bibliographic data bases through decentralized means.

2.0 Data Base Configuration

This project will be concerned with the configuration of the national bibliographic data bases, the national authority files, and the national location files. Many of the tasks required for this effort are being defined in the Phase 1 authority study, which is nearing completion. (See also Section 5.1, Task 2.) It is too early to know the exact group of individuals whose expertise will be required to solve many of the problems inherent in this work, but it is obvious that the configuration of the data base is an important aspect of technical planning. As such, it is included in the project list of the Network Technical Architecture Group even though individuals other than the present members of that group may be required to work on this effort.

REFERENCE

1. The NCLIS/NBS Task Force on Computer Network Protocols grew out of the ALA Information Science and Automation Division's Technical Communications Committee which was concerned with the establishment of a standard communications protocol to transmit messages in an online library networking environment. To accelerate the work of this committee, funds were provided by NCLIS to cover the travel expenses of the task force members as well as a contractual arrangement with the National Bureau of Standards to provide administrative support for this effort.